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Nondestructive Testing of Brazed Rocket Engine Components

Liquid-propellant rocket engines are comprised of numerous components and assemblies joined by welding and brazing. Joint quality must be maintained at a high level to ensure against fluid leaks and operational failure. During engine operation, some components are at the temperature of liquid hydrogen or liquid oxygen, while others are subjected to the high temperatures of combustion gases. In addition, the components must withstand large static and dynamic mechanical loading including vibration stresses.

A study has been made of nondestructive radiographic, ultrasonic, thermographic, and leak test methods used to inspect and evaluate the quality of the various brazed joints in liquid-propellant rocket engine components and assemblies. Details of this study are presented in an illustrated report. The report includes descriptions of some unique equipment and methods developed for nondestructive testing of complex assemblies. Also included in the report are sum-

mary tables giving the advantages and limitations of the various nondestructive test methods for specific geometries, material compositions, and joint accessibility.

Note:

Copies of the report may be obtained from:
Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama 35812
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Patent status:

No patent action is contemplated by NASA.

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Category 03